ABSTRACT OF THE DISCLOSURE

A plasma processing apparatus for processing an object to be processed using a plasma. The apparatus includes a processing chamber defining a processing cavity for containing an object to be processed and a process gas therein, a microwave radiating antenna having a microwave radiating surface for radiating a microwave in order to excite a plasma in the processing cavity, and a dielectric body provided so as to be opposed to the microwave radiating surface, in which the distance D between the microwave radiating surface and a surface of the dielectric body facing away from the microwave radiating surface, which is represented with the wavelength of the microwave being a distance unit, is determined to be in the range satisfying the inequality

$0.7 \times n/4 \leqq D \leqq 1.3 \times n/4$ (n being a natural number).